

**PROJECT DESCRIPTION FOR
WESTERN NEWFOUNDLAND DRILLING PROGRAM,
2013-2019**

Prepared by



for



and



Black Spruce Exploration Corp.

**March 2013
Project No. SA1174**

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2013-2019**

Prepared by

LGL Limited
environmental research associates
388 Kenmount Road, Box 13248, Stn. A.
St. John's, NL A1B 4A5
Tel: 709-754-1992
jchristian@lgl.com
www.lgl.com

In Association With

D.G. Taylor Inc.
74 Swansea Street
CBS, NL A1W 4S5
Tel: 709-834-2461 / 7158
Skype ID: dgtaylorinc
www.dgtaylorinc.com

and

Canning & Pitt Associates, Inc.
Box 21461, St. John's, NL A1A 5G2
Tel: 709-738-0133
www.canpitt.ca

Prepared for

Shoal Point Energy Ltd.
3rd Floor, 189 Water Street
St. John's, NL A1C1B4
Tel: 709-739-6679
www.shoalpointenergy.com

and

Black Spruce Exploration Corp.
3rd Floor, 189 Water Street
St. John's, NL A1C1B4
Toll-Free: 1-855-438-7711
www.blspexp.com

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1.0 Introduction and Regulatory Context

The Proponent, specifically Shoal Point Energy Ltd. (SPE) and Black Spruce Exploration Corp. (BSE), proposes to undertake an exploration and delineation drilling program (the Project) within its current Exploration Licences (EL 1070, EL 1120, EL 1097R) on the west coast of Newfoundland from 2013 to 2019. The locations of the three ELs are indicated in Figure 1.1. Under the terms of a Farmout Agreement between SPE and BSE, dated January 11, 2013, BSE will be the Operator. It should be noted, however, that subject to regulatory approvals, SPE, BSE or any future partners may serve as Operator during the Project. The Operator will honour all commitments, mitigations, etc., for any undertaking contemplated in this Project Description and subsequent Environmental Assessment.

In 2013, under this Project Description and subsequent environmental assessment, the Operator plans to conduct exploration drilling on a minimum of two wells, one on EL 1120 and one on EL 1097R. Depending on the results from the initial two wells, the Proponent may drill additional wells on any of these three license areas (EL 1070, EL 1120, EL 1097R) from 2013 to 2019.

Due to the nature of the target geological formations to be drilled, the Proponent anticipate the need to use near-wellbore stimulation technology which involves the injection of water-based or other fluids under high pressure to stimulate the target reservoir formations and allow the hydrocarbons therein to be recovered. Near-wellbore stimulation does include hydraulic fracturing. Industry best practices will be followed for any near-wellbore stimulation operations.

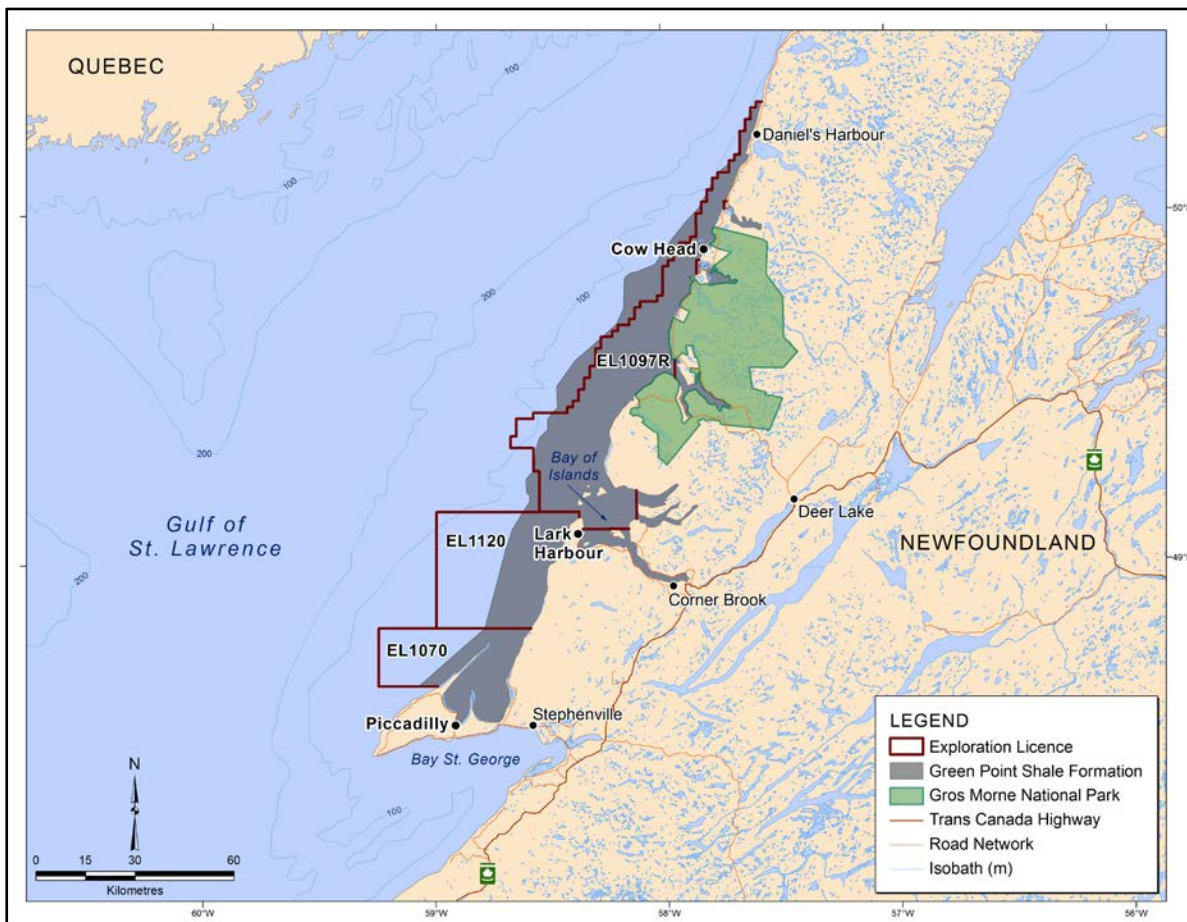


Figure 1.1 Location of Exploration Licences 1070, 1120 and 1097R.

The information presented in this Project Description is intended to enable the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) operating under the *Canada-Newfoundland Atlantic Accord Implementation Acts* to prepare a Scoping Document. The associated Environmental Assessment (EA) will be guided by the Scoping Document as well as technical and scoping advice received from the C-NLOPB, other federal agencies, and stakeholders engaged by the Proponent. In accordance with its mandate under the *Atlantic Accord Implementation Acts*, the C-NLOPB may issue an *Approval to Drill a Well* to allow SPE to carry out the drilling program if the EA is approved.

The proposed drilling activities have potential to affect fish and fish habitat, fisheries, seabirds, marine mammals and sea turtles. Therefore, both Fisheries and Oceans Canada (DFO) and Environment Canada are the primary federal agencies with interests and expertise in the environmental aspects of the proposed drilling program. Federal legislation that is relevant to the environmental aspects of the Project includes:

- *Canada-Newfoundland Atlantic Accord Implementation Acts;*
- *Oceans Act;*
- *Fisheries Act;*
- *Navigable Waters Act;*
- *Canada Shipping Act;*
- *Migratory Bird Act; and*
- *Species at Risk Act (SARA).*

There is no federal funding for this Project. The federal lands in the Newfoundland and Labrador Offshore Area involved in the Project are administered by the C-NLOPB.

While the proposed Project will involve drilling on federal lands, the Proponent recognizes that some supporting activities will take place within the jurisdiction of the Province of Newfoundland and Labrador. The provincial legislation that is relevant to this project is:

- *Newfoundland and Labrador Environmental Protection Act;*
- *Water Resources Act; and*
- *Historical Resources Act.*

The Proponent has discussed this Project Description with the Newfoundland and Labrador Department of Environment and Conservation (NLDOEC) during recent meetings held with them. The Proponent has learned that EA registration will likely be required under the environmental assessment provisions of the *Environmental Protection Act* to describe potential interactions between proposed Project activities and the environment (within provincial jurisdiction). In particular, the potential interaction between freshwater groundwater resources of the province and proposed drilling/hydraulic fracturing needs to be explored. The Proponent also understands that the C-NLOPB will consult with the NLDOEC in this matter.

Accordingly, the Proponent will, when required, register any proposed exploratory drilling within EL 1070, EL 1120, EL 1097R as part of the provincial EA process. The Proponent will provide three-dimensional conceptual models of the regional geology, in the form of geological maps and cross-sections. These conceptual models will show the spatial relationships between drilled aquifers and subsoil/bedrock units affected by the proposed

drilling/hydraulic fracturing activities. Focus will be on describing the presence or absence of credible flow paths linking these aquifers to the subsurface affected by the proposed activities.

Where possible, a description of the regional geology associated with each Exploration License will be made (i.e. the descriptions will be “play” focused).

As noted previously, Figure 1 depicts the general geographic area within which the Proponent expects to carry out an exploration and delineation drilling program from 2013-2019. The purpose of the Project is to determine the potential oil and gas resources on any current or future land holdings within this area. In addition, the Proponent anticipates that it may conduct drilling and associated activities on behalf of other operators with current or future land holdings in this area should such opportunities arise and commercial agreements and regulatory approvals be in place. It is also possible, should a suitable opportunity arise, that the Proponent would opt for another operator to conduct drilling activities on its behalf on current or future land holdings.

This Project Description is based upon information available to the Proponent at the time of writing. Not all Project details are presently known because all contractors and suppliers have yet to be selected. As the Proponent’s exploration activities on the west coast of Newfoundland proceed in the future, new leases may be acquired. All planned drilling operations and associated activities will be carried out within the geographic and temporal scope outlined in this Project Description and the subsequent EA. This document is an accurate reflection of the Proponent’s current level of knowledge.

2.0 The Proponent

Shoal Point Energy Ltd., an independent Canadian company with petroleum exploration and development interests, has had established offices in Toronto, ON since 2006 and St. John's, NL since 2011. This company is involved in exploration and development of crude oil and natural gas in Atlantic Canada and is committed to maximizing returns to stakeholders in an ethical, socially and environmentally responsible way. In addition to having interests in three ELs in western Newfoundland, SPE also holds a 6% interest in the South Stoney Creek exploration lands, situated approximately 20km south of Moncton, New Brunswick.

Black Spruce Exploration Corp. is an exploration and production company with offices in Corner Brook and St. John's, NL and is a subsidiary of Foothills Capital Corp. (www.foothillscapcorp.com). Black Spruce Exploration has signed, as of January 11, 2013, a farm-in agreement with Shoal Point Energy Ltd. for all three of Shoal Point Energy Ltd. EL's (EL 1070, EL 1120 and EL 1097R) in western Newfoundland. As indicated earlier, BSE will be the Operator as per the farmout agreement between BSE and SPE.

In the future, the Proponent may acquire interests in new licenses resulting from a Call for Bids or lands acquired from other operators.

2.1 Objectives

The Proponent's long-term goals include the following:

- Continue to identify areas of petroleum potential in western Newfoundland; and
- Plan and execute Proponent-operated exploration, appraisal/delineation, development, and production activities.

The Proponent's goals for the drilling program activities described in this Project Description include the following:

- Execute a cost-effective program while maintaining a policy of strict health, safety and environmental responsibilities that creates zero harm to the people and environment, and meets all due diligence requirements;
- Establish and maintain cost-effective relationships with suppliers and contractors, creating long-term mutual benefits and local infrastructure; and
- Optimize synergistic opportunities with other operators in the area.

The Proponent's western Newfoundland operations are managed from its NL office and operations will be supported by local logistics infrastructure and resources to the extent possible.

The Proponent is committed to conducting its operations in a manner that respects the environmental characteristics of the immediate area. It will comply with all applicable laws, regulations, guidelines, and codes of practice as well as particular commitments made during the application and review process for which this Project Description is submitted.

2.2 Project Management

The Operator will manage the Project directly out of its NL office. On site, the Operator will be represented by field consultants and an engineering team. Other key members of the Proponent's management team will be on site to provide geological input during periods when the reservoir target is being approached and drilled.

The drilling operations will be supported and controlled by the Operator, its engineering contractor and the drilling rig contractor's support group. Operations will draw on a supply chain based throughout Canada but primarily from Newfoundland. The primary communications link to the drilling locations will be a satellite-based internet service and cell phone located on site.

2.3 Social Responsibility & Canada-Newfoundland & Labrador Benefits

The Proponent is committed to the following:

- Improving the communities in which it operates, including supporting charitable, cultural, and community organizations;
- Supporting research and development, education and training, and technology transfer; and
- Employing qualified individuals without regard to race, religion, gender, national origin, or disability.

The Proponent commits to encouraging its suppliers and service providers to implement these same principles listed above.

The Proponent is committed to the industrial and employment benefits objectives of the *Canada-Newfoundland Atlantic Accord Implementation Act* (the Act) and C-NLOPB guideline titled *Canada-Newfoundland and Labrador Benefits Plan Guidelines* dated February 2006, including full and fair opportunity and first consideration. In the spirit of the Act, the company actively seeks to enhance the participation of individuals and organizations from Newfoundland and Labrador and elsewhere in Canada in oil and gas activity in western Newfoundland.

The Proponent is committed to bringing maximum benefits associated with the western Newfoundland drilling program to Newfoundland and Labrador. It seeks to strengthen the involvement of Newfoundlanders and Labradoreans, particularly those in Western Newfoundland, as well as other Canadians who have been participating in the oil and gas developments in the area. As such, BSE will strive to provide these individuals and companies with full opportunity to participate in project activities in western Newfoundland on a preferential basis wherever commercially achievable.

Where there is competitiveness in terms of fair market price, quality, and delivery, the Proponent will give hiring preference to those individuals and companies from western Newfoundland, followed by others from the remainder of Newfoundland and Labrador, and the remainder of Canada over those from other countries. Contractors and subcontractors working on the Project must also subscribe to and apply these principles of adjacency in their own operations.

2.4 Requirements for Equipment, Supplies, Materials

In addition to the drilling unit, the drilling program will require other equipment, supplies, and materials. Examples include office accommodation modules, power generating modules, mud and cement mixing systems, bottom hole assembly (BHA) tools, drill bits, and wellhead and well casing materials, drilling fluids, cements and additives. If hydrocarbons are found, well testing and near-wellbore stimulation equipment will also be needed in order to undertake drill stem testing and near-wellbore stimulation activities.

A number of supporting services will also be required from capable contracting companies for the exploratory drilling. Examples of these services will likely include rig operation services, directional drilling services, wellhead services, casing running services, mud services, cementing services, LWD/MWD services, logging services, coring services, geological services, and communications.

2.5 Proponent Contacts

Proponent contacts concerning this application are:

Mr. Derek Sullivan
HSE & Regulatory Affairs Manager
3rd Floor
189 Water Street
St. John's, NL A1C1B4
Office: (709) 753-2561
Mobile: (709) 730-8598
Fax: (709) 753-3626
Email: dsullivan@nl.rogers.com

2.6 Land Holdings

In April 2011, Shoal Point Energy Ltd. completed a farm-in agreement with Ptarmigan Energy Inc. (PEI) of St. John's, NL, with respect to EL 1120 in western Newfoundland. The agreement includes shallow rights to 80% of an area of approximately 27,229 hectares (ha) (i.e., 21,784 ha) which forms a 7 km wide band along the coastline defining the eastern border of EL 1120. "Shallow rights", as defined in SPE legal documents, refers to the section down to the base of the Green Point Shale Formation.

In September 2011, Shoal Point Energy Ltd. signed an agreement with Canadian Imperial Venture Corp ("CIVC") to acquire all of CIVC's interests with respect to EL 1070 in western Newfoundland. The purchase gives the company a 100% working interest in the shallow rights covering the approximately 68,698 ha of the Green Point Shale Formation in EL 1070, about 66.7% of the total hectareage.

In January 2012, Shoal Point Energy Ltd. entered into an agreement with NWest Energy Corp. to acquire 100% working interest in approximately 202,838 ha in EL 1097R, offshore western Newfoundland.

On January 11 2013, Shoal Point Energy Ltd. concluded a Farmout Agreement (“Agreement”) with Black Spruce Exploration Corp., a subsidiary of Foothills Capital Corp. The Agreement contemplates the continued exploration and development of SPE’s approximately 291,368 gross ha of Green Point “oil-in-shale” rights in offshore west Newfoundland.

The terms of the Agreement allow for two phases of earning during 2013-2015 which give Black Spruce Exploration Corp. the right to earn up to 60% of SPE’s working interests in its three Exploration Licenses (EL’s). See Table 3.1 for Shoal Point Energy hectarage.

3.0 Proposed Project

3.1 Name and Location

The official name of the Project is the Western Newfoundland Drilling Program 2013-2019. Shoal Point Energy Ltd.'s current ELs run along the western coast of Newfoundland from the Port au Port Peninsula to the Bellburns area just north of Daniel's Harbour (Figure 1). Exploration and/or delineation drilling could be carried out on any of the current or future land holdings the Proponent may acquire in this area from 2013 to 2019.

Shoal Point Energy Ltd. currently holds working interests or the right to earn interests in three (3) ELs offshore the west coast of the island of Newfoundland. On two of these, ELs 1070 and 1120, shallow rights only (including all the Green Point Shale Formation) are held, while on EL 1097R all rights are held. This current land position is summarized in Table 3.1.

Table 3.1 Current Shoal Point Energy Ltd. Land Interests in Newfoundland and Labrador.

Exploration License	Development	Exploration License Holder	Proposed Operator	Total Hectarage	SPE Hectarage	Percentage Held by SPE
EL 1070	Shoal Point, Port au Port Bay	Shoal Point Energy	Black Spruce Exploration Corp.	103,040	68,698	66.7 (shallow rights)
EL 1120	Lark Harbour Area (proposed)	Ptarmigan Energy Inc.	Black Spruce Exploration Corp.	104210	21,784	80 (shallow rights)
EL 1097R	Sally's Cove Area (proposed)	Shoal Point Energy	Black Spruce Exploration Corp.	202,838	202,838	100 (all rights)

3.2 Project Overview

The Proponent proposes to undertake an exploration/delineation drilling program on its west coast Newfoundland ELs (Figure 1) from 2013 through 2019. In 2013, under this Project Description and subsequent environmental assessment, the Operator plans to conduct exploration drilling at two drill sites, one on EL 1120 and one on EL 1097R as a minimum. It anticipates drilling additional wells on these license areas and EL 1070, or in any SDLs awarded within these ELs through to 2019, and potentially further into the future.

Activities associated with the drilling program include drill site preparation work, such as earthworks to construct bermed containment areas for the drilling operations and storage of drilling fluids and fuel, installation of drilling waste handling equipment and tankage, construction of temporary access roads, onsite rig installation, drilling, completions, vertical seismic surveying, well suspension or abandonment.

Due to the nature of the hydrocarbon-containing formations on its leases, the Proponent anticipates the need to use near-wellbore stimulation technology to hydraulically fracture the target reservoir formations in order to allow the hydrocarbons therein to be recovered.

Table 3.2 below estimates the typical timelines associated with the various activities of a drilling operation, these estimated timelines may change based on operational circumstances.

Table 3.2 Drilling Operations Timetable

Activity	Estimated Time to Complete
Drill Site Access and Preparation	4 - 6 weeks
Drilling Activities	4 - 6 weeks
Completion Activities	2 -4 weeks (including near-wellbore stimulation)
Total	10 – 16 weeks

Table 3.3 below estimates the level of vehicle traffic for larger trucks associated with the site preparation and drilling operations.

Table 3.3 Estimated Vehicle Traffic Associated with Drilling Activity

Activity	Number of Return Trips	Frequency	Activity Duration
Drill Site Preparation	10 -20	Daily	4-6 weeks
Drilling Rig Mobilization	30	One off	2-3 days
Drilling Operations	2 - 3	Daily	4-6 weeks
Completion Operations	30 - 50	One off	2-4 weeks

3.2.1 Spatial Scope

The Project Area (i.e., the area within which all project activities are planned to occur during 2013-2019) is defined as the extents of ELs 1070, 1120 and 1097R plus a one kilometre wide area inland of the low water mark from the southern limit of EL1070 to the northern limit of EL 1097R (Figure 3.1). Its total area is 4,731 km². All drilling locations are within the Project Area. The Study Area is defined as the Project Area plus a 10km wide area seaward of the western boundaries of the three ELs from the southern limit of EL1070 to the northern limit of EL 1097R (Figure 3.1). Its total area is 8,058 km². The terrestrial portion of both the Study Area and Project Area has an area of 297 km².

3.2.2 Temporal Scope

The temporal scope of the proposed drilling program is ‘year-round’ for the 2013-2019 period. The current anticipated start of these activities is April 2013.

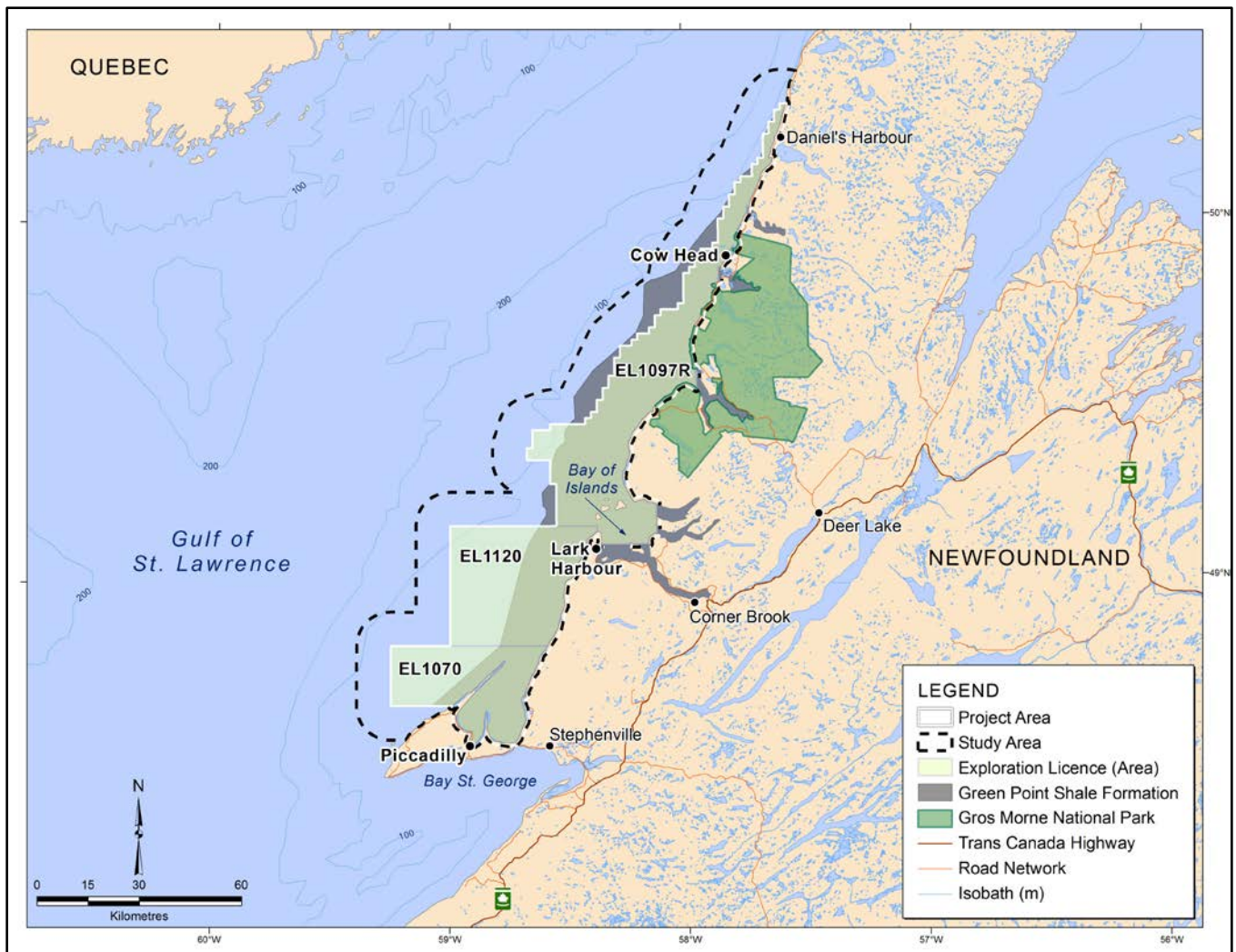


Figure 3.1 Delineations of Project and Study Areas.

3.2.3 Alternatives to the Project and Within the Project

The geological setting, surface oil seeps and recent seismic survey and exploration drilling operations on the west coast of Newfoundland undertaken by Shoal Point Energy Ltd. and other companies indicate the potential for viable hydrocarbon resources in the area. As a result, the Proponent has acquired interests, through farm-in arrangements within ELs that require it, in which to invest and undertake exploration activities on these licenses within specific time frames. Accordingly, there is no alternative to the proposed Project other than to incur the financial penalties attendant on not fulfilling these exploration commitments and to explore for oil and gas elsewhere.

Viable alternatives within the Project include the following:

- Options for siting onshore drill sites and routing any necessary road access to those locations

It is currently believed by the Proponent that commercial viability of this nearshore reservoir play needs to be established with lower cost land-based drilling.

Options for siting of onshore drill sites to minimize environmental effects will be evaluated during the Project planning process.

3.2.4 Program Phases and Scheduling

As already stated, the Proponent plans to drill exploration wells on all its current leases during the relevant lease periods for each lease, the longest of which extends to 2019.

The specific plans for 2013 are described below.

3.2.5 Site Specific Plans for 2013

In 2013, under this Project Description and subsequent environmental assessment, the Operator plans to start its Project by drilling a well on EL 1120 at a proposed location in the Lark Harbour area (Figure 3.2), and a second well on EL 1097R at a proposed location near Sally's Cove (Figure 3.3). Additional wells may be drilled in 2013 depending on the results from wells outlined above. Completion of all exploration drilling activities in 2013 will depend on the availability of a mobile drill rig and the time needed to drill each well. The above-noted well sequence will be carried over into 2014 if necessary. This sequence may be modified slightly to reflect the operational plans of a joint venture partner, if such a partner were identified and became Operator of the Project.

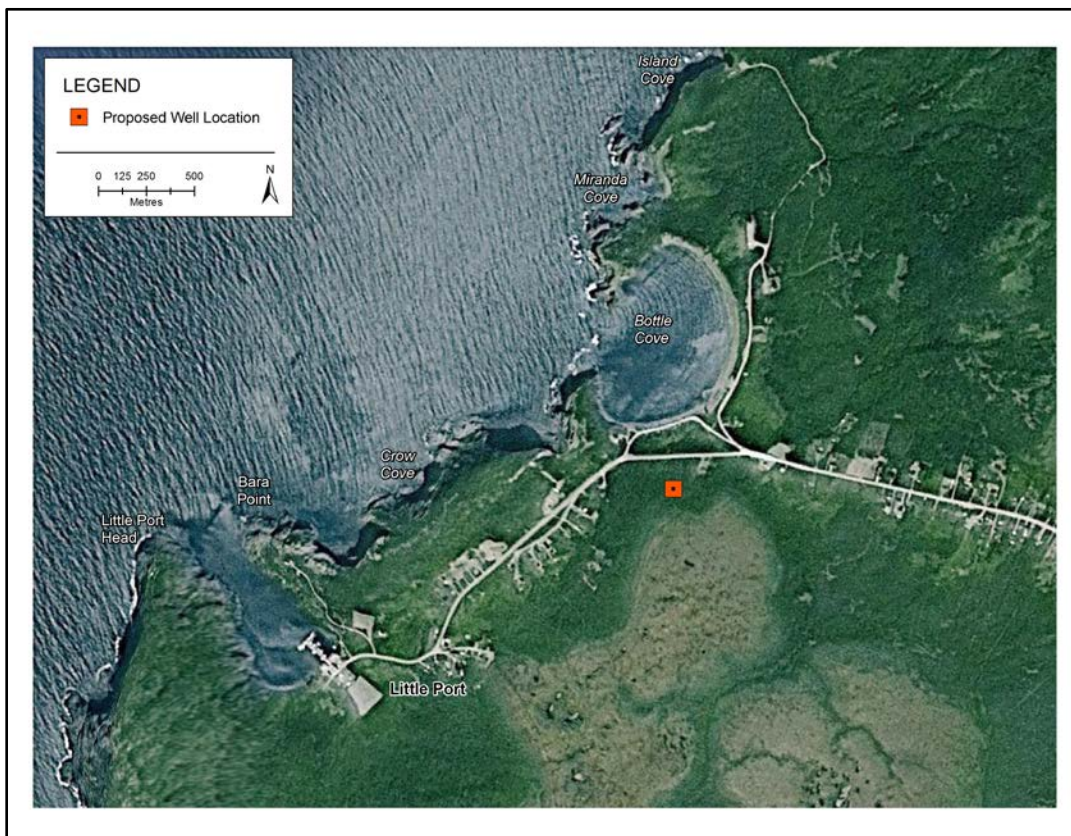


Figure 3.2 Approximate Location of Well Proposed for Lark Harbour



Figure 3.3 Approximate Location of Well Proposed for Sally's Cove.

3.3 Description of Proposed Drilling Program Phases and Activities

The following section describes the typical range of activities associated with the drilling of a well with the type of mobile onshore drilling rig to be employed during this Project.

3.3.1 Project Phases

Drilling a well from an onshore location into an offshore geological target will typically involve the following phases and activities.

3.3.1.1 Drill Site Access and Preparation

Readying a location for a drilling operation requires a series of site preparation activities to both accommodate the drilling rig and its attendant infrastructure and environmental protection works. The activities include the following:

- Construction or upgrade (i.e., resurfacing/grading) of the road access to the drill sites;
- Construction of 1-m high berm(s) at least 15 m back from the high water mark or adjacent water courses bordering areas as large as 200 m by 200 m to accommodate the drilling infrastructure and contain any accidental spills during the program;

- Construction of individual berms around any piece of equipment containing hydrocarbons, drilling fluids and other industrial fluids that is not a double walled tank. Fuel sources will all be stored in double walled fuel storage tanks supplied by the fuel dealer and approved by the provincial Services Newfoundland and Labrador Department;
- An Enviroliner may be used to contain drilled cuttings and underflow from solids control equipment; and
- Construction of a drilling pad for the drilling rig and associated support equipment.

3.3.1.2 *Drilling the Well*

Mobilization of the drill rig and its attendant infrastructure at the drill site will involve the transport of at least 20 truckloads of equipment and materials including:

- The drilling rig that includes weatherproof and heated blow out prevention (BOP) and crew facilities, 21,000 kPa (3,000 psi) or 34,500 kPa (5,000 psi) pressure control equipment, and drill mud (water-based or synthetic-based) handling and cuttings cleaning system; and
- Ancillary equipment mobilized to site may include operational support trailers, fuel tanks, a doghouse, a tool house, and generation facilities.

Actual drilling of the well will take approximately one month and include the following activities:

- Drilling of top-hole and setting casing;
- Drilling of an intermediate hole section and setting intermediate casing, if required;
- Drilling to target, optional LWD (logging while drilling) electric logs setting casing;
- Collection of direct geological data from gas sampling, cuttings and cores;
- Logging of the borehole using industry-standard techniques and equipment;
- Optional “open hole” testing if deemed beneficial (at the discretion of the Operator);
- Casing perforation in the target formation in preparation for well testing;
- Near-wellbore stimulation, if necessary;
- Flow-testing of encountered hydrocarbons; and
- Either proper suspension of the well and preparation for production in the case of a successful well, or proper abandonment of the well in the case of a non-productive well.

A typical drill site layout is shown in Figure 3.4, the overall dimensions of a wellsite could be as large as 200m by 200m. The entire perimeter of any wellsite will be bermed except for the entrance to the wellsite itself.

TYPICAL WELL AND LOCATION LAYOUT

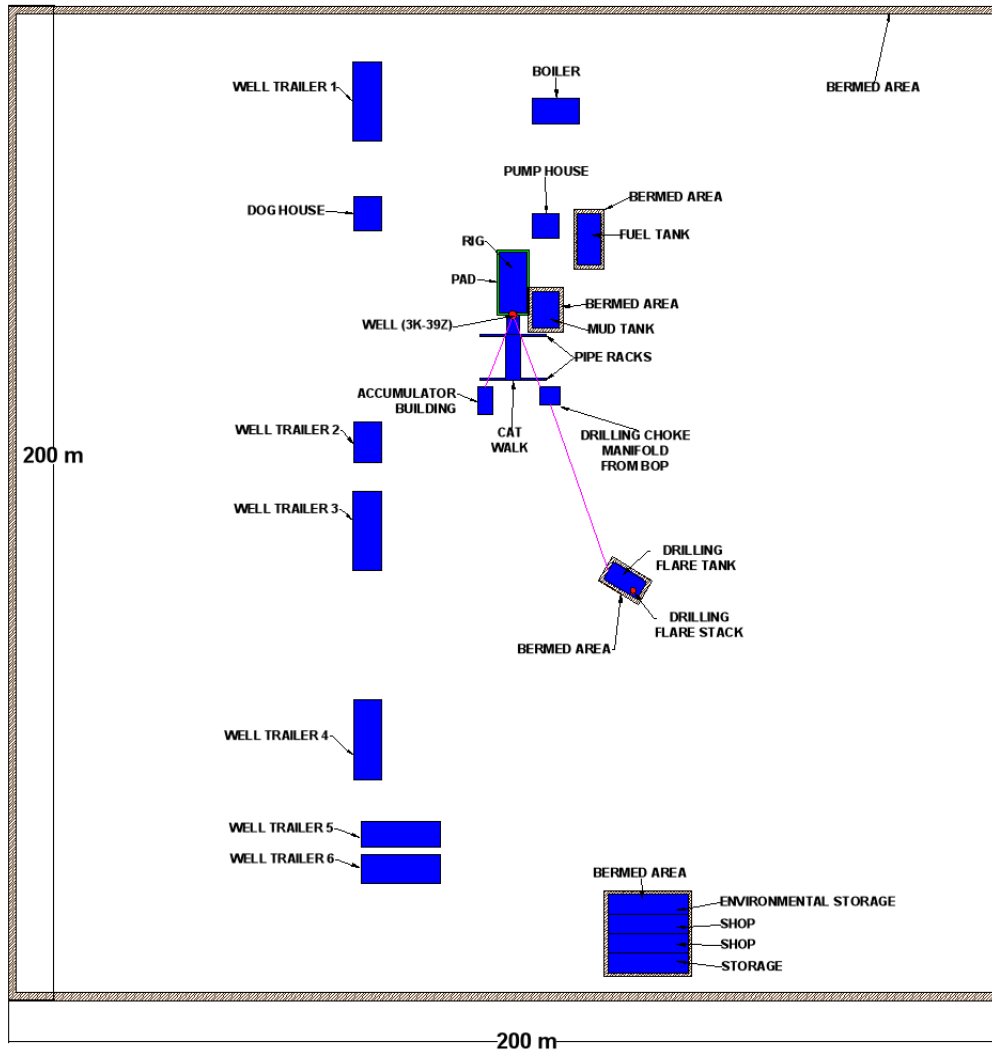


Figure 3.4 Schematic of a Typical Drill Site Layout.

3.3.1.3 *Well Testing and Evaluation*

When the well has reached its target depth or drilling wellbore conditions dictate, a geological evaluation will be undertaken to determine whether well testing is necessary. If well testing is carried out, the outcome will establish the quality, quantity, content and ultimately economic viability of the hydrocarbon-bearing formations and reservoir encountered. Well testing will require specialized contractors and equipment, personnel and procedures in addition to the drilling contractors, in order to facilitate flowing of the well.

During the testing of the well, fluids will be produced from the wellbore. Produced fluids may contain hydrocarbons, produced water or both. The produced gas will be flared in a proper flare stack and the produced liquids will be temporarily stored in double walled tanks on site and properly bermed as required. Appropriate approvals will be obtained for flaring/burning, and for on-site storage facilities as required. Produced water, if it occurs, will be stored on site in a double walled storage tank as per the *Newfoundland and Labrador Petroleum Drilling Regulations* and removed by a certified waste management contractor.

3.3.1.4 *Near-Wellbore Stimulation*

To evaluate the potential of the Green Point Shale, it is likely that near-wellbore stimulation (hydraulic fracturing) will be required in order to connect the wellbore with fissures and natural fractures to allow proper testing and evaluation of the economical and producible hydrocarbons within the reservoir.

This near-wellbore stimulation will allow the Proponent to properly test the movability of the hydrocarbon while keeping a safety factor in place for stimulation growth and minimizing the waste disposal of fluids used. This will allow the Proponent to further calibrate its models and properly assess future plans for economical production with the safety of the public and environment as the key priorities of the project.

The vertical depth and horizontal offset of the stimulation should minimize the risk to groundwater. The anticipated geology above and below the stimulation zone will limit the amount of fracture propagation. The proponent has committed to a water well monitoring program in association with the Project. Details of the monitoring program will be provided in the Environmental Assessment.

3.3.1.5 *Temporary or Permanent Well Abandonment*

If commercially viable hydrocarbons are encountered, production tubing or kill string will be run into the well and the well will be suspended or completed pending the onset of any production activities following approval of any development plan by the C-NLOPB and conformance to regulatory requirements both onshore and offshore.

If no hydrocarbons are encountered, and no further drilling is anticipated in that wellbore, the well will either be temporarily suspended or permanently plugged and abandoned in accordance with C-NLOPB and Provincial requirements as outlined in the Approval to Drill a Well. Well log data will be analyzed to determine how the well should be plugged to ensure isolation of any formations that may contain fluid or gas. The well will first be filled with fluid of sufficient density to over-balance the formation pressures found in the well. Typically, the well(s) will then be plugged using cement and bridge plugs in accordance with the current regulations, and will be tested appropriately as required.

Following this, the Operator will ensure that the wellhead and associated equipment is removed and that all exposed casing will be cut off below the ground level to an appropriate depth. The drill site will be restored to an environmentally stable, vegetated condition.

3.4 Environmental Management

The Proponent commits to carrying out all drilling related activities in compliance with federal and provincial environmental regulations, generally accepted industry practice, and its own environmental policies. In order to undertake this work in an environmentally responsible manner, various contingency and management plans (e.g., Contingency Plan for Event of Hydrocarbon Release, Contingency Plan for Well Control Incident and Loss of Well Control and Emergency Management Plan) will be finalized prior to the start of the work. All site personnel, including contractors and visitors, will be required to adhere to the provisions of these documents.

The Proponent will require all service providers to either be certified to the ISO 14001 Environmental Management standard or be in the process of obtaining that certification.

3.4.1 Spills

While it is the intention of the Operator to take all reasonable measures to prevent spills from occurring, there exists the unlikely chance that an unforeseen event may occur, resulting in a spill. The Operator's plans for spill response are discussed in detail in the company's Spill Response Plan, which is to be finalized prior to drilling.

In the unlikely event of an oil spill, in general, the response strategy is as follows:

- Immediately take steps to control the spill at, or as close to, the source as possible, with safety of personnel being the number one priority,
- Contain the spill on land and intercept/recover oil to prevent it from flowing unabated to the marine environment,
- Recover as much oil as possible, and
- Remediate contaminated areas. In addition to the above, it must be ensured that for all spills, appropriate levels of reporting are initiated as required.

In the event of a fuel spill, free oil that is contained within the bermed area or that has seeped into the subsurface will be recovered as soon as it is safe to do so using existing equipment onsite and if necessary additional equipment that will be mobilized to the site. The spill response equipment at site will be similar to that utilized during previous operations in western Newfoundland. This will likely include a combination of the following:

- Flotation containment booms,
- Spill kits, and
- Assistance and additional equipment from oil spill response contractor, if required.

Furthermore, soil that has been impacted above NLDOEC's TIER I levels will be removed for offsite treatment.

The risk, consequences and response to spills to the marine environment, although unlikely in this drilling scenario, will be addressed in the environmental assessment.

3.4.2 Near-Wellbore Stimulation

If near-wellbore stimulation is required, then specialized equipment to store any near-wellbore stimulation liquids will be required on site. These fluids will be contained in storage tanks within the bermed area. If near-wellbore stimulation technology is used, then these fluids will be recovered at the surface once the operation is complete, and stored in double walled storage tanks or in a properly lined collection pit as per the *Newfoundland and Labrador Petroleum Drilling Regulations* and removed by a certified waste management contractor.

As part of the technical evaluation of the need for near-wellbore stimulation, the environmental risks will be evaluated on a case by case basis. Of particular importance will be the need to determine if there are any aquifers that might be at risk. It is also very important that the near-wellbore stimulation program be designed to ensure that fractures propagate in the target formations and not into other geological strata.

3.4.3 Emissions and Waste Discharges

As with most industrial operations, a certain amount of waste (including solid and liquid waste, and air emissions) is expected to be generated. For the drilling operations described above, waste is expected to be limited. Waste from drilling operations is expected to include drilling fluids and cuttings, solid waste (including domestic and industrial waste) and grey/black water. In addition, hydrocarbons including oil and gas and produced water may be encountered during test operations and will need to be handled and disposed of as per as per the *Newfoundland and Labrador Petroleum Drilling Regulations* by a certified waste management contractor.

Methods for dealing with the specific waste materials anticipated are addressed in the following subsections.

3.4.3.1 Drilling Fluids (Muds) and Cuttings

The drilling fluids planned at this stage is a fresh water polymer system for the surface hole section in order to protect any ground water and a sea water polymer system for the main hole section. Synthetic-based mud will also be used in this Project. The mud system will be solids-free and as light as possible, consistent with safe well control. In all cases, there will be no operational discharges of drilling waste to the environment. Drilling waste will be temporarily stored in a properly lined collection pit, tested and disposed of as per as per the *Newfoundland and Labrador Petroleum Drilling Regulations* by a certified waste management contractor.

3.4.3.2 Produced Hydrocarbons

During well testing, any associated gas will be flared and oil will be recovered. Appropriate approvals will be sought to allow flaring and installation and use of storage facilities at site.

3.4.3.3 Grey/Black Water

All grey/black water will be collected in tanks and disposed of as per the *Newfoundland and Labrador Petroleum Drilling Regulations* by a certified waste management contractor.

3.4.3.4 Machinery Space Discharges

Machinery space discharges will be contained within their enclosed modules. Any spills will be collected with oil sorbents, stored on site in leak proof containers, and collected and disposed of as per as per the *Newfoundland and Labrador Petroleum Drilling Regulations* by a certified waste management contractor.

From other machinery such as diesel light towers, there is also the potential for ground spills through leaky lubricants and diesel spills during refueling. To mitigate this, there will be routine maintenance activities to minimize this risk and use of spill pans while refueling. Any engine oil discharges that reach the soil will be removed along with the contaminated soil and disposed as per the *Newfoundland and Labrador Petroleum Drilling Regulations* by a certified waste management contractor.

3.4.3.5 Cooling Water

The drives and brakes on the rigs will be water cooled. The cooling water system will be a closed system and that the water may be treated with chlorine as a biocide. The treated cooling water will be disposed of at the end of the campaign using a certified waste management contractor. If any cooling water has to be disposed of during the drilling process it will be done as per the *Newfoundland and Labrador Petroleum Drilling Regulations* by a certified waste management contractor.

3.4.3.6 Solid Waste

All trash and garbage that cannot be recycled will be stored in suitable containers and disposed of at an appropriate landfill site. Combustible waste (such as oily rags, oil filters, used oil, paint cans, etc.) will be appropriately stored and disposed of as per as per the *Newfoundland and Labrador Petroleum Drilling Regulations* by a certified waste management contractor. Hazardous wastes will be suitably stored, and, where necessary, sealed prior to disposal as per the *Newfoundland and Labrador Petroleum Drilling Regulations* by a certified waste management contractor.

3.4.3.7 Atmospheric Emissions

Atmospheric emissions produced during the drilling phases of the project are not anticipated to be significant. A certain amount of fugitive emissions is expected (i.e. atmospheric emissions other than those released from vents or stacks, such as atmospheric emissions from equipment leaks or fuel storage tanks). In addition, combustion gas emissions are expected from diesel combustion systems (e.g. engines and generators used during operations) as well as from the flare stack. Greenhouse gas and priority air contaminant reporting will be done in accordance with relevant regulatory requirements.

3.4.3.8 H₂S Gas Detection

There have not been any indications of H₂S in Western Newfoundland and there was not any sign of H₂S during the drilling of previous wells in recent years in western Newfoundland. The Operator will comply with the standard for H₂S wells and be equipped with five Scott air breathing kits, four personnel alarms and two 4-head gas detectors so that H₂S and other potential explosive hazards can be monitored at all times.

3.4.3.9 Sound

Noise will be emitted from the machinery involved in drilling the well. Typical noise levels associated with a mobile drilling unit (MDU) range from about 70 dB in the dog house area to about 110 dB in the generator, motor house, and vacuum pump areas. However, since noise levels diminish with distance, it is anticipated that the site noise will not reach annoyance or disturbance levels outside of the drilling boundary.

Drilling locations near or in inhabited areas will be sited so as to minimize disturbance to individuals and communities. To establish a baseline of noise and vibration levels, the Proponent commits to monitor the level of sound produced during the operational activities on the first well, both in-air in the vicinity of the MDU and at the seabed above the borehole.

3.4.3.10 Near-Wellbore Stimulation Fluids

The additional waste stream that will result from the near-wellbore stimulation activities described in Section 3.4.2 are the fluids that would flow back to the wellhead as a result of the near-wellbore stimulation. Typical recovered volumes range from 15% - 50% of the total volume injected as part of a near-wellbore stimulation. As indicated in Section 3.4.2, these fluids will be stored in double walled storage tanks or in a properly lined collection pit and disposed of as per the *Newfoundland and Labrador Petroleum Drilling Regulations* by a certified waste management contractor.

The seawater and sand mixture (95% and 4.5% of the total volume respectively) used in the near-wellbore stimulation process will also contain several additional chemical additives that will constitute approximately 0.5% of the total volume. Table 3.4 provides a list of the typical chemical additives used in this kind of near-well bore stimulation operations.

Table 3.4 Typical Chemical Additives Used in Near-Wellbore Stimulations.

Additive	Purpose
Acid	To dissolve minerals to help initiate near-wellbore fractures
Polyacrylmide	To minimize friction between fluid and pipe
Ethylene glycol	To minimize scale deposits on drill pipe
Borate Salts	To maintain viscosity of the fluid as temperature increases
Sodium or Potassium carbonate	To help ensure stability of other additives
Biocide (e.g. glutaraldehyde)	To eliminate bacteria in seawater
Guar Gum	A thickener to maintain sand in the seawater
Citric Acid	To prevent deposition of metal oxides
Isopopanol	To increase the viscosity of the near-wellbore stimulation fluid

4.0 Environmental Features

The physical and biological environments of portions of the area being considered for the Project have been described in previous environmental assessments and associated documents (LGL 2007a,b, 2010; CRA 2008a,b; Stantec 2012) and a Strategic Environmental Assessment (SEA) and addendum (LGL 2005, 2007c) for the general region commissioned by the C-NLOPB (<http://www.cnlopb.nl.ca/environment/wnseac.shtml>). An update to LGL SEA and addendum (LGL 2005, 2007c) is currently being prepared for the C-NLOPB.

The biological environment and resource use patterns of the area as well as the physical environmental conditions that will be encountered will be generally consistent with the descriptions and findings of these previous assessments. The environmental assessment of this Project will provide descriptions and analysis of the biological environment and resource use patterns and the physical environment including wind, ice, waves, and currents. The potential effects of the Project on the environment and the effect of the environment on the Project will also be addressed.

The proposed Project activities will be consistent with those of previous drilling programs carried out in the area. Nonetheless, potential effects will be examined in detail with focus on the Valued Ecosystem Components (VECs) (e.g., fisheries, Species at Risk) and cumulative effects with other users of the area.

4.1 Geographic and Temporal Scoping of the Assessment

The environmental assessment to follow will address the geographic and temporal scope of the project. While the overall temporal scope of the Project is 2013-2019, each EL essentially has its own temporal scope based on licence expiry dates.

The geographic scope will be based on the likely area of potential effects arising from planned drilling operations.

4.2 Valued Ecosystem Components

The Valued Ecosystem Components (VECs) to be addressed in the EA will include, but may not be limited to the following:

- Marine fish and fish habitat;
- Fisheries;
- Marine-associated birds;
- Marine mammals and sea turtles;
- Freshwater fish and fish habitat;
- Terrestrial birds;
- Rare terrestrial vegetation;
- Species at Risk;
- Potentially sensitive areas; and
- Historic resources.

4.3 Other Users

4.3.1 Fisheries

The Study Area includes portions of NAFO Unit Areas 4Rb and 4Rc which support a variety of fisheries (commercial, aquaculture, recreational, aboriginal). These fisheries will be described in the EA based on the most current available DFO landings data and other relevant information. Potential effects of Project activities on fisheries will be assessed in the EA.

4.4 Consultations

Since September 2012, the Proponent has held meetings with specific stakeholders and key persons, and open public meetings related to this Project.

Public consultation meetings were held at Piccadilly, Lark Harbour and Cow Head during 13-15 November 2012. These meetings were organized with the assistance of local agencies, groups, and several Town Councils in the area. The results of these consultations will be included in the Environmental Assessment.

5.0 References

- C-NLOPB (Canada-Newfoundland and Labrador Offshore Petroleum Board). 2006. Canada-Newfoundland and Labrador Benefits Plan Guidelines. ISBN 1-897101-14-7. 18 p. + app.
- CRA (Conestoga-Rovers & Associates). 2008a. Environmental Assessment of Geophysical Surveys for Exploration Licences 1097, 1098, 1103 and 1104 Western Newfoundland. Rep. by Conestoga-Rovers & Associates, Dartmouth, NS for NWest Energy Inc., St. John's, NL. 221 p. + app.
- CRA (Conestoga-Rovers & Associates). 2008b. Addendum to Environmental Assessment of Geophysical Surveys for Exploration Licences 1097, 1098, 1103 and 1104 Western Newfoundland. Rep. by Conestoga-Rovers & Associates, Dartmouth, NS for Geophysical Service Incorporated, Calgary AB and Houston Texas. 20 p. + app.
- LGL. 2005. Western Newfoundland and Labrador Offshore Area Strategic Environmental Assessment. LGL Rep. SA8858. Rep. by LGL Limited, St. John's, NL, Oceans Limited, St. John's, NL, Canning & Pitt Associates, Inc., St. John's, NL, and PAL Environmental Services, St. John's, NL, for Canada-Newfoundland and Labrador Offshore Petroleum Board, St. John's, NL. 335 p. + app.
- LGL Limited environmental research associates (LGL). 2007a. Port au Port Bay Exploration Drilling Program Environmental Assessment. Rep. by LGL Limited for PDI Production Inc., St. John's, NL., June 2007. 223 p.
- LGL Limited environmental research associates (LGL). 2007b. Port au Port Bay Exploration Drilling Program Environmental Assessment Addendum. Rep. by LGL Limited for PDI Production Inc., St. John's, NL., November 2007. 20 p. + app.
- LGL. 2007c. Western Newfoundland and Labrador Offshore Area Strategic Environmental Assessment. LGL Rep. SA8858. Rep. by LGL Limited, St. John's, NL, Oceans Limited, St. John's, NL, Canning & Pitt Associates, Inc., St. John's, NL, and PAL Environmental Services, St. John's, NL, for Canada-Newfoundland and Labrador Offshore Petroleum Board, St. John's, NL. 335 p. + app.
- LGL Limited environmental research associates (LGL). 2010. Port au Port Bay Exploration Drilling Program Environmental Assessment Update. Rep. by LGL Limited for Dragon Lance Management Corporation, Nisku AB. December 2010. 37 p. + app.
- Stantec (Stantec Consulting Ltd.). 2012. Environmental Assessment of the Ptarmigan Geophysical Program 2012-2021 Offshore Western Newfoundland. Rep. by Stantec Consulting Ltd., St. John's, NL for Ptarmigan Energy Inc., St. John's, NL. 320 p.